NCC
The National Computing Centre

GUIDES TO COMPUTING STANDARDS

A series of reference documents for standards for computing and office automation

Number 10 Automation in Bibliography

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November 1980

INTRODUCTION TO THE SERIES

The aim of this series of documents is to explain in general terms the main standards for computers, data processing and office automation, and especially to show the inter-relation between those that exist in groups. Each document will cover one such group or topic.

Standard specifications, by their nature, have to be precisely — even tersely — worded; there is no place for explanatory or tutorial text in them. Although every one is prepared taking into account all other related standards — so that they all form a harmonious and compatible whole — the text of each one keeps very strictly within its own limited scope. It is therefore inevitable that individual specifications are not easy to read, and often the significance or even meaning of many points in them, and the linking up with related standards, may be difficult to discern. It is to help overcome these characteristics that this present series of documents is being prepared.

The series is produced by the Standardization Office of the National Computing Centre, as part of its standards promotion activity. Each document is drafted by an expert in the particular topic — often one who has taken part in the actual standards-making work. The series is supported by the British Standards Institution, and their permission to use photo-reproduction from British and International Standards is gratefully acknowledged. It is emphasised, however, that these present documents are not a substitute for, nor an abstract of, the formal standards. These latter alone carry the authority and definitiveness that is a basic characteristic of a standard specification, and they must in all cases be referred to. For each individual document, the relevant formal standards are listed on the inside back cover.

The series was conceived and progressed on behalf of NCC by Hugh Ross and edited by Dorothy Noble and Hugh Ross.

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ISBN 0 85012 286 4

This series was produced as a result of a project funded by the Computers, Systems and Electronics Requirements Board of the Department of Industry. Their assistance is hereby acknowledged.

THE SET OF INTERNATIONAL STANDARDS ON AUTOMATION IN BIBLIOGRAPHY

1 Introduction

Librarians recognized the importance of standards such as cataloguing rules long before computers began to be used and so to a certain extent they were fortunate in being already accustomed to using standards when automation made them essential. Not long after the first attempts at producing catalogues by means of computers, the Library of Congress of the United States and the British National Bibliography Ltd* were formulating a standard in order to exchange catalogue records in machine-readable form. Now both libraries and abstracting and indexing services are providing tapes of the records, often as a by-product of computerized typesetting. A high level of standardization is important so that the maximum possible market can be reached by the data base providers. Many of the standards, official or unofficial as the case may be, which were in existence before automation are now seen to be more vital than ever. Increasingly, publishers as well as librarians and documentalists have become involved in establishing and promoting standards to the benefit of both groups. An early example of this cooperation is found in the United Kingdom in the establishment of the Standard Book Number (SBN) by a consortium of librarians and publishers.

2 Standards for Bibliography Information Interchange on Magnetic Tape

Specification for bibliographic information interchange format for magnetic tape

British Standard 4748:1971; ISO 2709-1973; US ANSI Z39.2.

This is the most important standard in the area covered by this document. The rapid growth of bibliographic information services at the same time as an increase in the use of data processing techniques has led to the widespread development of systems processing bibliographic material in machine-readable form.

* A private company, since incorporated into the British Library, which produces a weekly bibliography of the majority of publications received by the Copyright Receipt Office of the British Library.

Many organizations involved in the creation of records are non-profit making or government funded; in consequence, a great deal of cooperation takes place between these organizations, and standardization is of the utmost importance.

The Library of Congress was first in the field to develop a system for the exchange of machine-readable information between libraries. They developed a standard format capable of carrying fixed-length or variable-length data fields. In these each data field is identified by a tag stored in a directory which consists of a list of the tags and pointers to the data. In addition a label contains not only information about the arrangement of the tags and data but also codes to be defined by the users (implementation codes). The arrangement of the label, or leader as it is called, and directory of this format was adopted as ANSI Standard Z39.2 in 1971, but the tags and other indentifiers were excluded from the standard (though added as an appendix in the first edition) in order to make the standard more widely applicable for the exchange of records between bibliographic agencies outside of national libraries. The ANSI Standard was adopted in the same year by BSI and the format became an International Standard two years later.

A diagrammatic representation of the data fields reproduced from the International Standard is shown in Figure 1. This has been chosen rather than the British Standard as the terminology used in the diagram is more consistent. It can be seen that there are four alternative implementations according to whether indicators or subfields or both are used. Character positions 10 and 11 are each set to a number between 1 and 9 depending on the length of the indicators and the length of the subfield identifiers respectively. The directory map indicates the length of 'length of data field' and the length of 'starting character position' which must be the same for each entry in the record.

Whichever implementation is used, fields 001 to 009 do not have indicators or subfields and are known as reserved fields. Field 001 is reserved for the record identifier.

The ANSI Standard has been revised to include in the directory the possibility of an additional element of up to nine characters, the use of which, if present, shall be to contain information relating to the field referenced by the entry. Although the length of this area in the directory may be varied, it must be the same for all entries in the same record. The length of this area is set in character position 22 of the leader. The area is undefined in the standard. A number of uses have however been envisaged for the character positions including a code to denote the bibliographic level of the relevant field, a code to denote the standard of the data contained in the field or a code to denote the relationship of that field to others in the record.

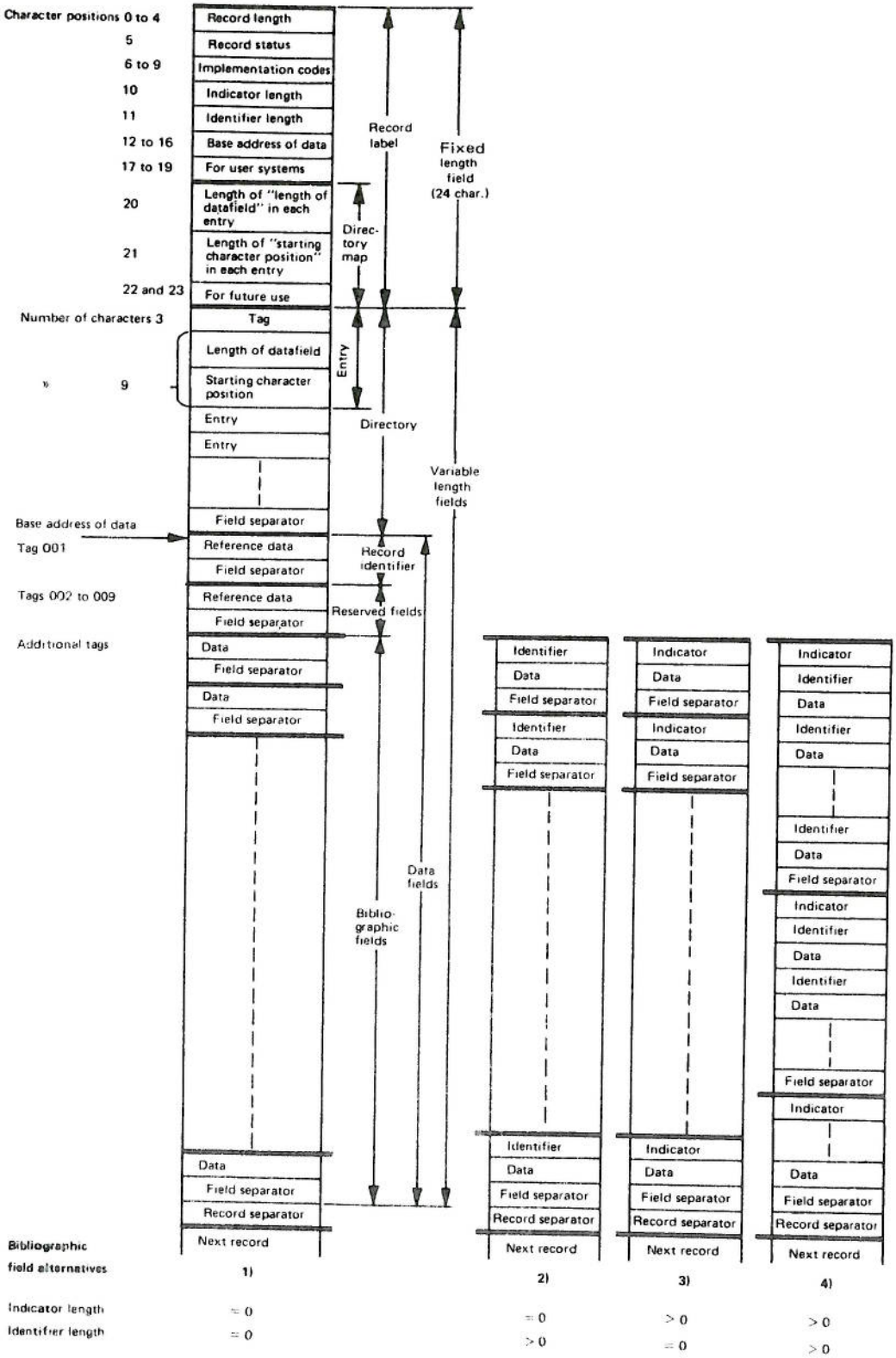


Figure 1- Detailed Structure of Record Format

The International Standard is being revised to follow the ANSI Standard. In both cases, the earlier standard will be a valid implementation of the revision.

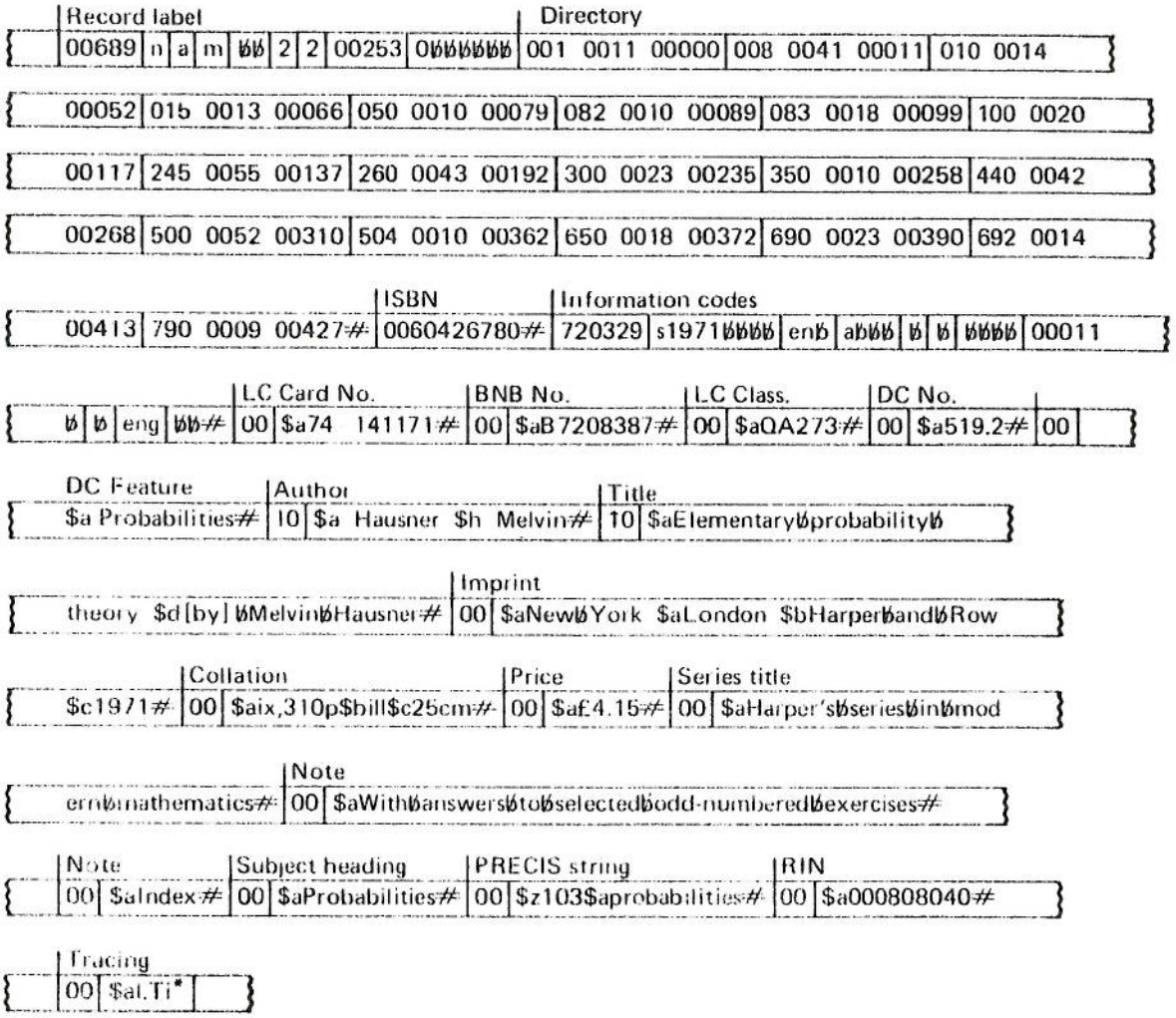
The British Standard lists a number of other standards which must be used by any implementation of BS 4748. These specify the character set to be used (ISO 646) and extension techniques for additional character sets (ISO 2022), the implementation of this character set on magnetic tape (ISO 962), the labelling and file structure for the magnetic tape (ISO/R 1001), and the format and recording standard for 9-track 12.7 mm (0.5 in) magnetic tape (ISO 1863).

The standard does not specify the content of the bibliographic record and it does not, except in the case of tag 001, assign meaning to any of the tags, indicators or data element identifiers (known collectively as content designators) or implementation codes. There is no standard which specifies these, but two documents which have the force of standards are readily accessible to the English-language user and do specify the content designators.

2.1 UK MARC manual - First standard edition, London: British Library, 1975.

This document is aimed at librarians interested in the bibliographic content of the MARC (Machine Readable Cataloguing) record, the systems analyst concerned with the information required to manipulate by program the exchange record in machine-readable form and the cataloguer creating MARC records for a computerized system. This system is the one used by the British Library for much of its automated cataloguing, and by a large number of libraries in the United Kingdom. It is closely related to the other MARC systems used throughout the world. The format is intended to hold records which are catalogued according to the first edition of the Anglo-American Cataloguing Rules (1967) and consequently the manual is to be revised to cater for the second edition of the Rules (1978), due to be implemented in 1981.

An example of an exchange tape record is shown here by kind permission of the British Library, Figure 2. Note that character positions 20 and 21, which are blank in the example, are used in a non-standard way. They should be filled with 4 and 5 respectively to indicate that the 'length of data field' area is 4 characters and the starting character position field is 5 characters in length.



The character ⍽ is the blank (hexadecimal 20 or octal 00). This is the only type of space present on the tape. All other spaces and breaks between fields in the above examples are introduced to aid reading and do not appear on the tape.

Figure 2 — A record as held on the BNB MARC exchange tapes

2.2 Reference manual for machine-readable bibliographic descriptions, prepared by the UNISIST/ICSU-AB Working Group on Bibliographic Description; compiled by M D Martin, Paris: Unesco ,1974.

This document, prepared by a group of international experts, contains a list of tags which represent the data elements required not only by libraries but also by abstracting and indexing services. Part 1 of the manual is a guide to the selection of data elements depending on what types of bibliographic materials are being recorded. Part 2 defines the data elements in such detail that it is virtually a set of cataloguing rules. Part 3 gives guidelines on the use of the record label or leader. International Standards are extensively recommended by the manual. This manual is maintained by the UNISIST International Centre for Bibliographic Descriptions, and is at the moment under revision to take into account, amongst other things, the revision of ISO 2709. The revised edition will be published in 1980.

A list of the fields together with a matrix, indicating in records of which types of material the fields are essential, is reproduced in Figure 3.

3 Numbering Systems in Documentation

In any automated documentation system a unique key to each work represented by a record will be of assistance to the efficient running of the system. As soon as records are exchanged between systems, it becomes vital to be able to identify uniquely the work to which the records relate, in order to avoid having duplicate records in the system. To facilitate these aims, standard numbering systems have been devised with the support not only of librarians and documentalists but also of publishers. These numbers are now widely used by booksellers and publishers for ordering purposes, as well as by librarians for retrieval of documents.

Documentation - International standard book numbering

ISO 2108-1978

The scope of this standard is to specify the method of constructing an International Standard Book Number (ISBN).

An ISBN is a ten-character number made up of four components -

(a) Group identifier;

(b) Publisher identifier;

(c) Title identifier;

(d) Check character.

Tag	Field name	Serial		Book			Report		Thesis	Patent
		A	M	A	M	C	A	M	M	A/M
AØ1	International Standard Serial Number (ISSN)	E	E							
AØ2	CODEN (interim alternative to ISSN)	*	*							
AØ3	'Short title' of serial	E	E							
AØ4*	Series designation									
AØ5	Volume number	E	E	E[1]	E[1]					
AØ6	Issue or part number	E	E	E[1]	E[1]					
AØ7	Other identification of issue or part	E	E							
AØ8	Title of contribution (analytic)	E		E			E			
AØ9	Title of volume, monograph or patent document		E	E	E		E	E	E	E
A1Ø	Title of collection			E[1]	E[1]	E				
A11	Person associated with a contribution	E		E			E			
A12	Person associated with a monograph		E	E	E			E	E	
A13	Person associated with a collection					E				

1. **For books (at analytic and monographic levels) fields AØ5, AØ6 and A1Ø are essential only if the item is part of a collection having numbered parts.**

* **Tags marked with an asterisk indicate data elements which are never designated as essential.**

Tag	Field name	Serial		Book			Report		Thesis	Patent
		A	M	A	M	C	A	M	M	A/M
A14	Affiliation – contribution	E		E			E			
A15	Affiliation – monograph		E							
A16*	Affiliation – collection									
A17	Corporate author – contribution	E		E			E			
A18	Corporate author – monograph		E		E			E		
A19	Corporate author – collection					E				
A2Ø	Page numbers	E	E	E			E			
A21	Date of issue or imprint	E	E	E	E	E	E	E	E	
A22	Date of publication[2]									E
A23	Language(s) of text	E	E	E	E	E	E	E	E	
A24*	Language(s) of summaries									
A25	Publishers name and location (monograph or collection)			E	E	E				
A26	International Standard Book Number[3] (ISBN)			E	E	E				
A27	Edition			E	E	E				

2. Field A22 may be used for any literature type where the actual date of publication is known to differ from the nominal date of issue.
3. Field A26 (ISBN) may be used for any type of literature if the publisher has chosen to assign an ISBN to the piece being recorded.

* Tags marked with an asterisk indicate data elements which are never designated as essential.

Figure 3

Tag	Field name	Serial		Book		Report			Thesis	Patent
		A	M	A	M	C	A	M	M	A/M
A28	Collation: description of non–serial collection					E				
A29	Collation: description of monograph				E	E		E	E	E
A3Ø	Name of meeting[4]									
A31	Location of meeting[4]									
A32	Date of meeting[4]									
A33	Identification of patent document									
A34	Person associated with a patent document									E
A35	Corporate body associated with a patent document									E
A36*	Domestic filing data									E
A37*	Convention priority data									
A38*	Reference to a legally–related domestic document									
A39	Report number						E	E		

4. **Fields A3Ø, A31 and A32 are essential regardless of literature type - if and only if the piece is formally designated as constituting the published proceedings of a meeting.**

* **Tags marked with an asterisk indicate data elements which are never designated as essential.**

Tag	Field name	Serial		Book		Report			Thesis	Patent
		A	M	A	M	C	A	M	M	A/M
A4Ø*	Name of performing organisation									
A41	University (or other educational institution)								E	
A42*	Degree level									
A43	Availability of document						E	E	E	
A44*	Source of abstract									
A45*	Number of references									
A46*	'Summary only' note									
A47*	Abstract number(s)									
A99	Ancillary data									

* **Tags marked with an asterisk indicate data elements which are never designated as essential.**

Figure 3 continued

Components (a), (b) and (c) are of variable length (within the overall fixed length of the number), and are made up of arabic digits 0 to 9. Component (d) is a single character, which may be the letter X or any of the digits 0 to 9.

In order to be able to validate an ISBN, or to insert spaces or hyphens on printing out the number from the packed form on tape, it is necessary to know the range of distribution of the components (a) and (b).

The following table gives the range distribution of the group identifiers -

0 - 7
80 - 94
950 - 997
9980 - 99899
99900 - 999999

The following table gives the range of publisher identifiers when the group identifier is of one digit only (i.e. 0 - 7)

00 - 19
200 - 699
7000 - 8499
85000 - 89999
900000 - 949999
9500000 - 9999999

These are taken from The ISBN system: users' manual, 2nd edition. Berlin: International ISBN Agency, 1978.

When the group identifier is of more than one digit there is no standard set of publisher identifiers and the ISBN Agency of each country decides within the constraints of the system which ranges should be used. The following tables give the ranges of publisher identifiers for those countries as published in ISBN review 1 (1), 1977. They are reproduced here by kind permission of the International ISBN Agency.

Belgium

(publications in Dutch)
Group identifier: 90

00 - 19
200 - 599
6000 - 6999
70000 - 79999
800000 - 899999
9000000 - 9999999

Denmark

Group identifier: 87

00 - 29
400 - 649
7000 - 7999
85000 - 89999
970000 - 999999

Egypt

Group identifier: 997

200 - 699
7000 - 8499
85000 - 8999

Finland

Group identifier: 951

0 - 1
20 - 54
550 - 899
9000 - 9499
95000 - 99999

Hong Kong

Group identifier: 962

00 - 19
200 - 699
7000 - 7299

Hungary

Group identifier: 963

05 - 19
200 - 699
7000 - 8499
85000 - 89999

Netherlands

Group identifier: 90

00 - 19
200 - 599
6000 - 6999
70000 - 79999
800000 - 899999
9000000 - 9999999

Nigeria

Group identifier: 978

100 - 199
2000 - 2999
30000 - 34999

Norway

Group identifier: 82

00 - 19
500 - 599
7000 - 7499
90000 - 94999
990000 - 999999

Spain

Group identifier: 84

00 - 19
200 - 699
7000 - 8499
85000 - 89999
900000 - 949999

Sweden

Group identifier: 91

0 - 1
20 - 49
500 - 649
7000 - 7999
85000 - 94999
970000 - 999999

Unesco

Group identifier: 92

0 - 5
60 - 79
800 - 899
9000 - 9999

Further information on the use of ISBN is available from the International ISBN Agency.

This agency can provide any information on the use of the ISBN and its structure. They publish The ISBN system: users' manual, 2nd edition, 1978 which contains and elaborates on the 1978 version of ISO 2108, and ISBN review, an irregular periodical. Each country or group of countries has a group agency which distributes blocks of ISBN to the publishers and ensures that they are correctly applied.

Documentation - International standard serial numbering

ISO 3297-1975

This standard defines the use of a standard code (ISSN) for the unique identification of serial publications. Serial is defined here as a publication, in printed form or otherwise, issued in successive parts usually having numerical or chronological designations and intended to be continued indefinitely.

The ISSN consists of eight digits, consisting only of the Arabic numerals 0-9, except that the last digit, a check digit, may also be X. Each serial publication is to have an ISSN, and each ISSN is to belong only to one serial. The ISSN is associated with the 'key title', a standardized form of the title derived from the title according to rules which are contained in this standard. If the title of a serial changes, a new key title and ISSN will be given to the serial.

An international centre to oversee the allocation of key titles and ISSN has been set up. Called the ISDS* International Centre it is supported partly by Unesco and partly by the member countries which have their own national centres, or share a regional centre with neighbouring countries.

The aim of this network is to build up files of records of serials which contain a common set of data elements considered sufficient for the identification of a serial. These data elements are listed in an annex. A further annex gives the procedure for calculating the check digit for ISSN.

4 Codes Suitable for use in Automated Systems

A number of systems of codes have been adopted as official standards. Those which are widely used by automated bibliographic systems are included here.

* International Serials Data System

Specification for codes for the representation of names of countries

British Standard 5374:1976; ISO 3166-1974; US ANSI Z39.27

This standard provides a two-letter and a three-letter alphabetic code for representing the names of countries, dependencies and other geopolitical areas for purposes of international exchange. It is maintained and updated to take account of political changes.

Symbols for language, countries and authorities

British Standard 3862:1965; ISO/R 639-1967

The International Standard and the British Standard differ in presentation and content. In Annex D, the International Standard gives a list of national standards organizations alongside country codes for each country which has a national standards organization. These codes should be ignored in favour of the country codes in BS 5374 (see above). Annex B gives a list of language codes for 38 different languages. These codes also appear as Table 1 of BS 3862:1965. They are not wholly satisfactory as they include only the most common languages, but they are the only set of language codes available as official standards. However, the most widely used set of language codes in computerized systems among library and abstracting and indexing services is that devised and maintained by the Library Congress for their own use and for the use of the MARC system. This is most readily available in Appendix B of the UK MARC manual. This version is not complete, but contains codes for almost 300 languages, so it will be sufficient for most purposes.

5 Standards for Abbreviations

Designers of automated systems often employ abbreviations in order to save computer storage space, and even to save space in the final printed product. This is not always ideal from the point of view of retrieval, especially in titles of monographs which are not conventionally abbreviated. However in those parts of the record which are not likely to be used as search keys, such as data relating to pagination or size, abbreviations may be recommended as also in the case of serial titles which are now recorded for bibliographic purposes in a standard form by the International Serials Data System. The following standards should be used where required.

Documentation - Bibliographical references - Abbreviations of typical words

ISO 832-1975.

This International Standard lists abbreviations of typical

words in bibliographical references to documents listed in bibliographies, catalogues etc., excluding the generic names of periodicals which are the subject of British Standard 4148: Part 2:1975 Abbreviation of titles of periodicals - Word-abbreviation list. The standard includes words from 32 different languages, all employing the Roman alphabet. It begins with the rules for abbreviating followed by a list of abbreviations in Roman characters and a separate list of abbreviations of words in languages written in Cyrillic characters. These are generally formulated according to the rules in the first section although certain abbreviations are included which break the rules because they were already well established in particular languages. The Roman and Cyrillic lists are divided into two parts, the first arranged in alphabetical order of word and the second in alphabetical order of abbreviation.

Specification for the abbreviation of titles of periodicals - Word-abbreviation list

British Standard 4148:Part 2:1975; ISO 833-1974

This part of the British Standard gives the recommended abbreviations for words and roots of words that are commonly used in the titles of periodicals in many different languages. Two lists are included, the first giving alphabetically the full forms of the words followed by the abbreviations, the second giving alphabetically the abbreviations followed by the full forms. A summary of the principles of abbreviation is included; more detailed principles are found in Part 1 of the standard. There is also a transliteration table for Slavic Cyrillic characters to Roman characters, along with the rules used for treating modified Roman letters (i.e. those with diacritics, etc.) in European languages. This Standard is equivalent to ISO 833-1974 which has been withdrawn as an International Standard as the list is to be maintained in future by the International Serials Data System International Centre, from whom it will be obtainable. The British Standard is also to be withdrawn similarly. Both these standards rely on ISO 4-1972 which is equivalent to British Standard 4148: Part 1:1970 Abbreviations of titles of periodicals - Principles.

6 Display of Citations in Bibliographies or Catalogues

A number of standards exist which specify the content and display format of citations in bibliographies or catalogues. Output of machine-readable records should be arranged according to these specifications.

Recommendations for bibliographical references

British Standard 1629:1976; ISO 690-1975; US ANSI Z39.29

In the scope of the standard it is stated that the standard is intended to give guidance to those making bibliographical references in works which are not themselves primarily bibliographical. However, the standard has proved to be more suitable for use in creating bibliographies and catalogues than in listing references in books, so much so that a new standard was published in 1978 - British Standard 5605 Recommendations for citing publications by bibliographical references - for the guidance of authors (as opposed to librarians) making references to publications.

BS 1629 gives a list of the mandatory and optional data elements to be used in references to books, periodicals, serial contributions and patents. Examples are given of minimum and expanded references. No punctuation is recommended, though the examples are themselves consistent in the use of punctuation. Brief notes are given on the representation of each data element. The page dealing with references to a book is reproduced here, Figure 4.

Recommendations for bibliographical references to maps and charts - References in accessions lists

British Standard 5195:Part 1:1975

Scope: This part of the standard sets out the information which should be given in references to printed and manuscript maps in accessions lists. Rules and examples of full and minimal references are given.

Patent documents - Bibliographic references - Essential and complementary elements

ISO 3388-1977

This standard gives rules for the uniform presentation of bibliographic references in the field of patent documents, and examples are given of full and short forms of reference. Large sections of the ICIREPAT manual produced by the World Intellectual Property Organization are included to assist in identifying the bibliographic data in a patent document.

Specification for data elements essential to the interchange of serials records

British Standard 5332:1976

This standard specifies a set of data elements essential to serials records held in the UK National Serials Data Base which has been set up as part of the International Serials Data System. It is also intended to facilitate the exchange of serials records between libraries. This

(a) to the publication as a whole	Relevant clauses	(b) to a portion of a publication*, other than a separate contribution (see 4.4)
Name(s) of author(s) or compiler(s), personal or corporate, if given†	5	*Name(s) of author(s) or compiler(s), personal or corporate, if given†*
Title of the publication	6	*Title of the publication*
Translation of the title	6.2	Translation of the title
Title of the original (if the publication is itself a translation)	6.2.2	Title of the original (if the publication is itself a translation)
Edition number, or other specification of the edition, if not the first	6.5	*Edition number, or other specification of the edition, if not the first*
Name(s) of editor(s), translator(s), illustrator(s), etc.‡	6.5	
Place(s) of publication	7.1.1	Place(s) of publication
Publisher(s)	7.1.2	Publisher(s)
Year(s) of publication	7.2	*Year(s) of publication*
Number of volumes, if more than one		
Pagination	7.3	
Mention of any	7.4	
illustrations, etc.		
bibliography		
summary		
index		
Size		
Title of series and number in the series§	7.5	
International Standard Book Number	6.1	Title of series and number in the series§
Price		International Standard Book Number
	7.6	
	7.2.4	*Volume and/or part number* when applicable. Separate title of volume or part. *Specific page(s) or first and last pages (or other clear identification, e.g. section no.) of the portion(s) referred to*

Examples

Single-volume work

Minimum reference

HOEL, Paul Gerhard. Elementary statistics. 3rd ed. 1971.

Expanded reference

HOEL, Paul Gerhard. Elementary statistics. 3rd ed. New York, Chichester: Wiley, 1971. x,309 p.; ill., index. 24 cm. (Wiley series in probability and mathematical statistics.) ISBN 0 471 40300 8. £4.50

Minimum reference

HOEL, Paul Gerhard. Elementary statistics. 3rd ed. 1971. pp. 19--33.

Expanded reference

HOEL, Paul Gerhard. Elementary statistics. 3rd ed. New York, Chichester: Wiley, 1971. (Wiley series in probability and mathematical statistics.) ISBN 0 471 40300 8. pp. 19--33.

* References to passages in literary works, or to certain texts such as laws, may be made in terms of the formal division of the text, which may replace any or all of the items after the title in column 4.2(b).

† When references are being assembled in a list it is acceptable to follow the Harvard system in which the year of publication is given immediately after the name of the author, or, if the list is arranged by subject (as in many abstracting services), to give the title before the author.

‡ Any part of this information that applies to all editions precedes the edition number.

§ Many works issued in series by research bodies and similar organizations are commonly identified by series title and number. In a reference to such a publication the series title and number are essential elements, but may be given in a generally recognized abbreviated form.

Figure 4 — Reference to a book or other separately issued publication

standard is based closely on ISO 3297 International standard serial numbering (see p.11 of this document). The standard lists only the elements to be stored in the data base and does not deal with punctuation and layout in the printed bibliographic record.

International Standard Bibliographic Description. London: IFLA International Office for UBC, 1977.

Although not official standards, these documents, covering so far monographs, serials, cartographic materials and non-book materials, and to be further extended, define the data elements required to facilitate the exchange of bibliographic records, taking as a basis the text found on the title page of the work being recorded.

They lay down strict rules concerning the visual layout of the records including an elaborate system of punctuation which separates and defines the data elements.

The ISBD's are primarily intended as the basis of the rules for description in national cataloguing rules. They are not concerned with rules governing headings (access points) for catalogue entries.

7 Ordering of Citations in Bibliographies or Catalogues - Filing Rules

Specification for alphabetical arrangement and the filing order of numerals and symbols

British Standard 1749:1969

This British Standard is concerned with the alphabetical arrangement of simple entries in bibliographies, catalogues, directories, indexes and lists of all kinds, but it gives guidance on the arrangement - not solely alphabetical - of complex entries, and on the filing of numerals and symbols. It does not include rules for determining the form of entries, nor for arranging words in non-Roman alphabets.

It gives the basis of arrangement as -

first: symbols;

second: numerals (in numerical order)
(1) Roman
(2) Arabic
(Roman and Arabic numerals are not interfiled);

third: the English alphabet A-Z.

Symbols may be given a conventional order which must be stated at the head of the file. Otherwise they can be given the filing value of the word they represent (e.g. & spells out as and).

The standard explains and gives examples of word-by-word and letter-by-letter filing, preferring the former -

Word-by-word	Letter-by-letter
Black Acts	Black Acts
Black Book	Blackberry
Black Earth	Black Book
Blackberry	Blackburn
Blackburn	Black Earth

Word-by-word filing is known as the 'nothing-before-something' principle; account is taken of spaces between words. Spaces are ignored in letter-by-letter filing.

The other examples in the standard are, where applicable, based on the word-by-word principle.

Hyphens and apostrophes are treated as spaces for filing purposes. Note, however, that the comma is ignored in this example taken from the Standard -

Jack, E. and L., Ltd.
Jack's Cafe
Jack, T.
Jacks, A.B.
Jacks-Bateson, M.L.

Rules are given for abbreviations, chemical formulae and contractions in names as in St. John, Robert or M'Kenzie, John.

General guidance is given on the ordering of complex entries; these may be ordered alphabetically as -

MERCHANTS
MERCHANTS - Export
MERCHANTS - Export - Falkland Islands
MERCHANTS - Export - Far East
MERCHANTS - Import
MERCHANTS - Import - Kuwait
MERCHANTS - Import - Middle East

or in a logical, chronological or hierarchical order -

TEXTILES - history
TEXTILES - history - Roman
TEXTILES - history - Mediaeval
TEXTILES - history - Industrial Revolution

This standard has changed little since the first edition of 1951. In the early days of computerized filing, the tendency was to simplify filing rules. However the move is now back to more complex rules though incorporating only those complexities that the computer can deal with. This standard is due to be revised once developments get under way on an international set of bibliographical filing rules.

8 Subject Systems

Many catalogues and bibliographies contain some sort of subject index in addition to an author and title index. This subject index is often arranged according to a classification scheme. Ordering references according to a classification scheme using notation rather than natural language has an advantage over other methods of ordering: it makes it possible to place references to works on the same subject next to each other in a list, which is not achieved by ordering references in alphabetical order of author or title. Indeed this cannot even be achieved by listing references in alphabetical order of subject headings; in this case, for example, bee would come next to beef, beer and beet and wasp would come at the end of the list.

As well as ordering lists of references in catalogue entries, classification schemes are perhaps best known for their use in ordering books on library shelves, where all the advantages stated above apply.

One of the first schemes to become widely used was the Dewey Decimal Classification devised by Melvill Dewey and first published in 1876. This is now in its 19th edition and is widely used in the United Kingdom, especially by public libraries; it is also used by the British National Bibliography to order the main sequence of references to works published in the United Kingdom.

In 1905 the Institut International de Bibliographie (now the Federation Internationale de Documentation) published a scheme based on the Dewey scheme which later became known as the Universal Decimal Classification (UDC). The British Standards Institution is responsible for maintaining the English-language edition of the Classification and it is available as British Standard 1000: Universal Decimal Classification (UDC) - English full edition in over 100 parts. The following documents are intended as an introduction -

British Standard 1000A:1961 UDC Abridged English Edition

British Standard 1000C:1963 Guide to the UDC

It is disputable whether the UDC is an ideal scheme for automated indexing systems. Although the classification numbers are built up by synthesizing individual elements with their own distinct meaning, combinations can arise which only very complex computer programming could resolve. Nevertheless its detail and flexibility as a system for arranging references cannot be denied and it is highly recommended for use in very specialized bibliographies.

9 Future Developments

With the development of on-line information retrieval, standardization in the field of automation in bibliography will become no less important. Because it takes some time for formal standards to be adopted, none is yet available relating particularly to on-line other than those concerned with the telecommunications aspects of on-line which are dealt with elsewhere in this series. However an ISO Working Group has recently been set up, as a result partly of representation from the EEC (on behalf of the EURONET project) through the national standards bodies of member states, to formulate a standard application level protocol. Its aim is to develop a common command language for automated information retrieval systems.

Microforms are increasingly the product of automated systems and ISO is studying the proposals for standards for the headers of microfiches for monographs and serials which, in a sense, constitute a reference to the work contained on them.

Standard numbering systems are urgently needed for all classes of bibliographic materials, to help alleviate the problem of duplicate records in bibliographic systems which take input from different sources. The Americans already have a standard which is important in this area as a basis for the establishment of standard numbering systems -

Development of identification codes for use by the bibliographic community

US ANSI Z39.33-1977

This standard presents basic guidelines for the development of new identification code standards as well as for the modification of existing standards for use by the bibliographic community. The standard envisages that authorities will be set up to manage each code established according to its guidelines.

At the moment work is going on in various standards organizations to establish standard numbering systems to identify uniquely records, reports, authors and libraries.

Character sets are being devised for bibliographic purposes, recognizing the special needs of bibliographic systems. These include a mathematical character set, and control characters for bibliographic purposes, as well as character sets for Greek and for African languages that use a modified Roman alphabet, and extended character sets for the Roman and Cryillic alphabets. Work is planned for the future on Hebrew and Arabic character sets.

Existing standards are continually being modified. One such is ISO/R 30, Bibliographical strip. Dating from 1956, the idea of a concise summary of bibligraphical reference data printed at the foot of the front page of the cover of a periodical has largely been superseded by the work of the International Serials Data System, and this recommendation therefore has not been mentioned earlier in this document. The new standard, provisionally entitled ISO 30 Bibliographic identification (Biblid) of serial publications, specifies the form of bibliographic identification to be given on volumes, issues, the first page of an article and subsequent pages of an article. Each level of a serial publication, volume, issue, article and page, will have printed on it in a prescribed place a reference in a form that can be copied directly into an automated system.

As mentioned in Section 2, there is no International Standard governing the contents of bibliographic records. A Working Group of ISO is at present studying a data element directory prepared under the auspices of Unesco (United Nations Educational, Scientific and Cultural Organization) which is intended to form the basis of a standard set of data elements to be used in conjunction with ISO 2709 and the equivalent national standards.

It is expected that this will be compatible with those national and international systems that are based on or related to the MARC and the Reference Manual formats.

The standards specifically referred to in this document include —

BS 1000A:1961	Universal Decimal Classification (UDC), abridged English edition
BS 1000C:1963	Guide to the Universal Decimal Classification (UDC)
BS 1629:1976	Recommendations for bibliographical references
BS 1749:1969	Alphabetical arrangement and the filing order of numerals and symbols
BS 4148:	Abbreviation of titles of periodicals –
Part 1: 1970	Principles
Part 2: 1975	Word abbreviation lists
BS 4748: 1971	Bibliographic information interchange format for magnetic tape
BS 5195: Part 1:1975	Recommendations for bibliographical references to maps and charts— References in accessions lists
BS 5332:1976	Data elements essential to the interchange of serials records
BS 5374:1976	Specification for codes for the representation of names of countries (= ISO3166)
ISO 639—1967	Symbols for languages, countries and authorities
ISO 832—1975	Documentation — Bibliographical references — Abbreviations of typical words
ISO 2108—1978	Documentation — International standard book numbering (ISBN)
ISO 3166—1974	Codes for the representation of names of countries (= BS 5374)
ISO 3297—1975	Documentation — International standard serial numbering (ISSN)
ISO 3388—1977	Patent documents — Bibliographic references — Essential and complementary elements

The above may be obtained individually, or as a special offer pack, ref NCC/BSI Pack 10, from—

Dept M12
BSI Sales
101 Pentonville Road
London N1 9ND

NB. Where a British Standard is photo-reproduced (=) from an International Standard, only the British version will be included in the pack.

ANSI Standards are available from —

British Standards Institution
Sales Department
Maylands Avenue
Hemel Hempstead
Herts HP2 4SQ

Other documents:

UK MARC manual, London: British Library, 1974 —

British Library, BLAISE,
7 Rathbone Street,
London W1P 2AL

International Standard Bibliographic Description (5 vols: Monographs, General, Serials, Non-book materials Cartographic materials). London: IFLA International Office for UBC, 1977 —

c/o British Library, Reference Division
Great Russell Street
London WC1B 3DG

Reference manual for machine-readable Bibliographic descriptions. Paris: Unesco, 1974 —

Unesco, UNIBID British Library,
Sheraton House, Great Chapel Street,
London W1V 4BH

ISBN system: user's manual
2nd ed. Berlin: Intnl ISBN Agency, 1978 —

International ISBN Agency
Staatsbibliothek Preussischer
Kulterbesitz
Postfach 1497, Potsdamer Strasse 33,
D--1000 Berlin 30
German Federal Republic